Space Weather Forecast

Issued on Thursday, 12 October 2023 at 01:19 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Chance of Moderate class flares. Chance of G1/Minor Geomagnetic Storm intervals day 1.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Low activity was observed, with only Common class flares observed. There are currently nine sunspots on the visible disc. AR3451 has reached the western limb and is now difficult to analyse due to the foreshortening effect, and therefore maintains it's previous classification. AR3460 has simplified, losing its delta spot. AR3465 is currently thought to be the largest region, though appears largely stable at present. All other spots are small and simple.

Solar Wind / Geomagnetic Activity: Solar winds have persisted at generally slow-ambient conditions. Total interplanetary magnetic field was weak throughout. The north-south component was weak and variable, ranging from -4/+4 nT. Geomagnetic activity has been Quiet (Kp 0-1).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) remained at background levels, with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Low activity is likely with a chance of increasing to Moderate with isolated M-flares. The risk may then reduce from 13 Oct as the large spot in the northwest departs the disc.

Solar Wind / Geomagnetic Activity: A coronal mass ejection which left the sun on 08 Oct may arrive at Earth on 12 Oct. Solar winds are expected to remain slow until Earth moves into the fast wind of a large coronal hole in the west of the disk from early on day 1 (12 Oct), peaking at slightly elevated or elevated levels of 450-550 km/s and lasting until day 2 (13 Oct). Later on day 2 (13 Oct) winds are anticipated to gradually ease back toward background speeds.

Quiet (Kp 0-2) geomagnetic activity is expected initially, this increasing to largely Unsettled to Active (Kp 3-4) through day 1 before easing into day 2, with a chance of G1/Minor storm periods due to combined coronal hole high speed stream and coronal mass ejection arrivals. Activity easing to mainly Quiet to Unsettled (Kp 0-2) later on Day 2 (13 Oct), with no further enhancements currently expected.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is most likely to remain at background levels.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	20	5	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	50	40	40	40
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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